

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
21 May 2004 (21.05.2004)

PCT

(10) International Publication Number
WO 2004/042457 A3

(51) International Patent Classification⁷: **G02B 17/00**,
G02F 1/15

(21) International Application Number:
PCT/US2003/035381

(22) International Filing Date:
5 November 2003 (05.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/423,903 5 November 2002 (05.11.2002) US
60/490,111 25 July 2003 (25.07.2003) US

(71) Applicant (for all designated States except US): **DONNELLY CORPORATION** [US/US]; 414 East Fortieth Street, Holland, MI 49423 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **MCCABE, Ian**,

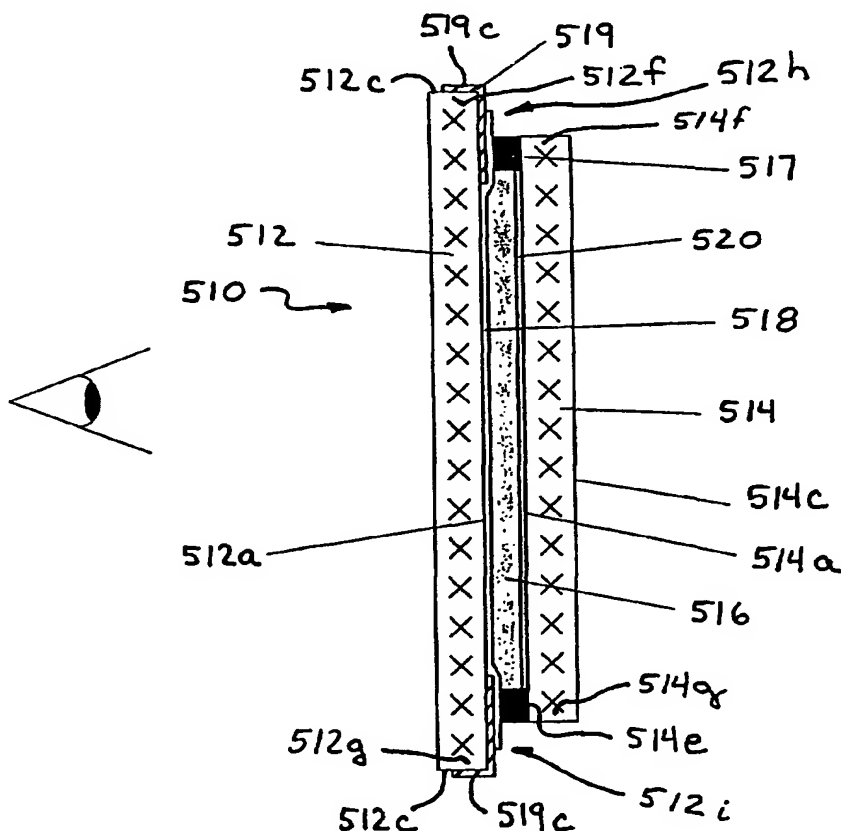
A. [IE/US]; 16092 Ransom Street, Holland, MI 49424 (US). **VARAPRASAD, Desaraju** [US/US]; 1281 Innisbrook Court, Holland, MI 49423 (US). **HABIBI, Hamid** [IR/US]; 190 Standish, Holland, MI 49423 (US). **LYNAM, Niall, R.** [US/US]; 248 Foxdown, Holland, MI 49424 (US).

(74) Agents: **VAN DYKE, GARDNER, LINN & BURKHART, LLP** et al.; 2851 Charlevoix Drive SE P.O. Box 888695, Grand Rapids, MI 49588-8695 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: **ELECTRO-OPTIC REFLECTIVE ELEMENT ASSEMBLY**



(57) Abstract: An electro-optic reflective element assembly (510) includes a pair of substrates (512, 514) and an electro-optic medium (516) sandwiched therebetween. Each of the pair of substrates includes at least one conductive or semi-conductive layer (518, 520) disposed thereon. The electrical connections may electrically connect to a respective layer and may be electrically isolated from the other layer, such as via non-conductive regions (514e) of the substrates and/or deletion lines along one of the conductive layers. The pair of substrates may be positioned relative to one another such that overhang portions (512h, 512i) of the front substrate (512) extend beyond the corresponding edges of the rear substrate (514). The overlapping relationship may provide clearance for electrical connection to the conductive layers of the front and rear substrates such that the electrical connections are substantially not viewable through the front substrate.



(84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
5 August 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/35381

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G02B 17/00; G02F 1/15

US CL : 359/603, 604, 607, 608, 265-271

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 359/603, 604, 607, 608, 265-271

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
USPTO EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,668,663 A (VARAPRASAD et al) 16 September 1997 (16.09.1997), fig. 11C, column 21, line 56-column 23, line 38	1-40
Y	US 5,066,112 A (LYNAM et al) 19 November 1991 (19.11.1991), figs. 6 and 8, column 15, lines 1-11	1-40
Y	US 5,078,480 A (WARSZAWSKI) 7 January 1992 (07.01.1992) Fig. 18, column 54, line 55 - column 57, line 2	5, 25
A	EP 0356099 A2 (YAMADA et al) 28 February 1990 (28.02.1990) fig. 3	1, 21
A	US 4,773,740 A (KAWAKAMI et al) 27 September 1988 (27.09.1988). figure	1, 21
A	JP 362075619 A (TOMITA) 07 April 1987 (07.04.1987), fig. 3	1, 21

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

02 April 2004 (02.04.2004)

Date of mailing of the international search report

27 MAY 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Drew Dunn

Telephone No. (703) 305-4900